

REMARKS

Status of Claims

Claims 1-2, 4-7, and 9-10 are currently pending in this application.

Verified Translation of Priority Document

A verified translation of the priority document DE 102 55 797.7 is filed herewith. Accordingly, Applicants claim entitlement to the priority date of November 28, 2002.

Present Invention

Prior to discussing the specific points of rejection, Applicants briefly discuss the differences between the present invention and the prior art.

Onboard systems for detection of objects in the environment of the own moving vehicle system, for example, for an ACC (Adaptive Cruise Control) system, must deal with a large amount of data to be evaluated, sometimes more data than the onboard computer can “cope” with.

As disclosed in paragraphs [0007]-[0008] of Kishida, in a prior art system the highest priority is assigned to data that is being detected with continuity, and lower priority detected data is stored in a buffer until computer capacity is available to process it. If numerous target objects are present around a moving vehicle, the data buffer included in the microcomputer has no empty area. Thus, it takes much time to verify and process the newly detected numerous target objects. The time delay causes a delay in controlling the moving vehicle utilizing a conventional ACC (Adaptive Cruise Control) system, which is very disadvantageous under real conditions.

Kishida solves this problem by prioritizing detected objects, and tracking/storing, within the limited computer buffer space, based on the prioritization of objects. However, the area to be scanned, and the amount of data gathered for processing, remains the same.

The present invention, in contrast, makes it possible to carry out real-time-capable forward-looking sensing of the surroundings using standard hardware. This is accomplished by dividing the perception region into a plurality of component-regions, processing the surroundings

data to detect objects, classifying the detected objects as to relevance, assigning an evaluation priority to each component region on the basis of the relevance of the objects detected in the component region, subjecting each of the plurality of component regions to a type of evaluation based on the evaluation priority assigned to each component region, and issuing a warning to a driver of the road vehicle based on a result of the evaluation.

Owing to the division into such perception component-regions it is possible to subject surroundings data to a specific evaluation. ... It is also conceivable to make different computing capabilities, for example complex, multi-stage algorithms, available for different perception regions (paragraph [0012]). By means of a specific evaluation within individual perception component-regions ... the quantity of data to be evaluated is considerably reduced, thus permitting rapid processing of the data for the sensing of the surroundings (claim 1 and paragraph [0014]). That is, by reducing the amount of incoming data from component regions evaluated as having lesser importance, the overall quantity of data to be evaluated is considerably reduced.

As disclosed in paragraph [0023] of the specification, the perception region is divided into a plurality of component-regions (A...D) in order to subject the surroundings data to a multi-stage evaluation. As disclosed in paragraph [0017], in particular in the case of the classification methods which are based on learning from examples it is possible to adapt different classifiers for different perception component-regions. Thus, areas evaluated to be of greater interest are given higher evaluation quality, or areas in which specific search objects are expected are given specific classifiers.

In this way, the amount of data to be screened is reduced.

The prior art fails to teach a method for data analysis by which "the quantity of data to be evaluated is considerably reduced".

Turning now to the Office Action, the points raised by the Examiner are addressed in turn.

Response to Arguments

The Examiner disagrees with Applicant's argument that that Kishida does not teach prioritization of component regions. According to the Examiner, Kishida teaches giving priority based on an object and location and therefore teaches prioritization of zones.

In response, Applicants first submit that by perfecting the claim to entitlement to the priority date of November 28, 2002, Applicants remove Kishida as a reference.

Nevertheless, Applicants submit that Kishida is technically distinguishable from the present invention. That is, Kishida merely uses a system for prioritizing specific objects for evaluation by the limited computation power of the on-board computer, with objects of lower priority being stored in buffer until computer space is available. See Kishida paragraph [0012] "... if the number of the static target objects exceeds the maximum number of data permissible with the storage capacity of the data storage unit, higher priority is given to detected data associated with a static target object located in the closer position to the moving vehicle and the detected data is stored in the data storage unit" and paragraph [0013] "Further, ... higher priority is given to detected data associated with a target object located in a lane in which the moving vehicle is traveling and the detected data is stored in the data storage unit. In contrast, detected data associated with a target object located in the farther position from the current lane is not stored in the data storage unit."

Thus, Kishida does not change the amount of data collected, but rather, simply teaches discarding data of lower priority objects if data exceeds storage capacity. Kishida does not teach any way to accelerate area scanning by managing the volume data to be gathered, i.e., to prioritize component areas. Thus, Kishida still scans the entire perception area, and does not make possible real-time-capable forward-looking sensing of the surroundings.

Next, the Examiner considers that features upon which applicant relies (i.e., pre-assigns priority to different scanned zones or component regions and prioritization, to allow higher interest areas to be processed first or more often) are not recited in the rejected claim(s).

In response, Applicant clarifies claim 1 to make more explicit the data-reduction object of

the present invention, i.e., to recite “subjecting each of the plurality of component regions to a type of evaluation based on the evaluation priority assigned to each component region, wherein the quantity of data evaluated from individual perception component regions of lesser priority is reduced in comparison to component regions assigned a higher evaluation priority” as supported by paragraph [0014] of the application as filed.

Next, the Examiner indicates that Applicant argues that Nishigaki does not disclose or suggest dividing regions into lane and tolerance regions next to the lane. Kishida further teaches that the perception region is restricted to the lane ([0013]). Kishida does not explicitly teach defining a tolerance region, but “tolerances” are often included in engineering applications to account for variations in system components and objects being viewed.

In response, Applicants point out that there is a difference between a “tolerance”, which is a “fudge factor”, and the “tolerance region” of the present invention, which is not a “fudge factor” but rather a specific predefined area with a definable expectation of search objects (e.g., road signs, lane markings, etc.).

Withdrawal of the rejection is respectfully requested.

Claim Rejections - 35 USC § 112

Claims 1-2, 4-7, and 9 are rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Classifying the detected objects as to relevance and assigning an evaluation priority to each component region on the basis of the relevance of the objects detected in the component region do not appear to be in the original disclosed.

In response, Applicants refer the Examiner to the above Brief Review of the Invention the following supporting disclosure was pointed out:

- owing to the division into such perception component-regions it is possible to subject surroundings data to a specific evaluation. ... It is also conceivable to make different computing capabilities, for example complex, multi-stage algorithms, available for different perception regions (paragraph [0012]);
- by means of a specific evaluation within individual perception component-regions ... the quantity of data to be evaluated is considerably reduced, thus permitting rapid processing of the data for the ["real time"] sensing of the surroundings (paragraph [0014]);
- in particular in the case of the classification methods which are based on learning from examples it is possible to adapt different classifiers for different perception component-regions. Thus, areas evaluated to be of greater interest are given higher evaluation quality, or areas in which specific search objects are expected are given specific classifiers (paragraph [0017]); and.
- the perception region is divided into a plurality of component-regions (A...D) in order to subject the surroundings data to a multi-stage evaluation. (paragraph [0023]).

It is respectfully submitted that the above demonstrates support for the claim limitations of

- classifying the detected objects as to relevance, and
- assigning an evaluation priority to each component region on the basis of the relevance of the objects detected in the component region.

Withdrawal of the rejection is respectfully requested.

Claim Rejections - 35 USC § 103

Claims 1-2 and 10 are rejected under 35 U.S.C. §103(a) as being unpatentable over Kishida (US 2003/0222812) in view of Nishigaki et al. (US 6,775,395), Maekawa (US

5,530,771), and Morcom (International Patent Application Publication WO 02/082201).

The Examiner indicates that Applicant cannot rely upon the foreign priority papers (with filing date of November 28, 2002) to overcome this rejection because a translation of said papers has not been made of record in accordance with 37 CFR 1.55. See MPEP § 201.15.

In response, Applicants submit herewith a verified translation of the priority document DE 102 55 797.7 (which German language priority document corresponds identically with the text of the German language PCT application, and accordingly, the English language translation of the priority document corresponds to the English translation of the PCT application as filed as part of the National Stage Entry on may 16, 2005).

The primary reference Kishida having been removed as a reference, and the secondary references not remedying the defects in the teaching of the primary reference or teaching the invention on their own, withdrawal of the rejection is respectfully requested.

Claims 4-6 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kishida, Nishigaki, Maekawa, and Morcom as applied to claim 1 above, and further in view of Saka et al. (US 6,792,147).

In response, Applicants submit herewith a verified translation of the priority document DE 102 55 797.7 (which German language priority document corresponds identically with the text of the German language PCT application, and accordingly, the English language translation of the priority document corresponds to the English translation of the PCT application as filed as part of the National Stage Entry on may 16, 2005).

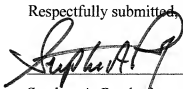
The primary reference Kishida having been removed as a reference, and the secondary references not remedying the defects in the teaching of the primary reference or teaching the invention on their own, withdrawal of the rejection is respectfully requested.

U.S. Application No.: 10/535,157
Amendment D
Reply to final Office Action dated January 6, 2009

Attorney Docket No: 3926.150

Favorable consideration and early issuance of the Notice of Allowance are respectfully requested. **Should further issues remain prior to allowance, the Examiner is respectfully requested to contact the undersigned at the indicated telephone number.**

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Stephan A. Pendorf', is written over a horizontal line.

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